

## **Health Information Exchange**

Infrastructure Management  
&  
Policy Development Workgroup

September 11, 2006

## I. Introduction

In a recent review of nearly 3,000 “sentinel events”<sup>1</sup> in health care settings over a one-year period, the Joint Commission on Accreditation of Healthcare Organizations found that nearly half of those related to delays in treatment were the result, at least in part, of the failure of communications systems to provide timely, accurate clinical information at the point-of-care. In a national report on the use of interconnectivity in health care, researchers from the University of Alabama have concluded: “there appears consensus that at least two thirds of the [medical error-related] fatalities [in the United States annually] can be prevented [through electronic information sharing], thus a saving of some 60,000 lives”.<sup>2</sup>

The lack of a nationwide electronic system for sharing medical data creates costly inefficiencies and redundancies. The federal government estimates that effective digital record keeping would save \$140 billion in health care costs annually.<sup>3</sup> Most experts agree that exchanging health information is extremely complicated, given the disparities in health information and health information technology. Adoption of an electronic health record is not enough. Even when computer systems are in use, most of the information is fragmented and stored in what has often been described as “silos,” separated from and not easily available to other providers. Moving in the direction of a patient-centered model of health information creates the potential for significant efficiencies and improved health care delivery.

Health information exchange (HIE) requires electronic health records to be interoperable: disparate information systems must be able to operate in conjunction with each other through shared or translated protocols and standards.<sup>4</sup> HIE serves as the enabling infrastructure to support a move away from the current provider- or system-centric data model, in favor of a patient-centric approach. The need for this paradigm change is at the core of the benefit of HIE, along with the need to increase and improve productivity, and reduce provider liability for information-related medical errors. The magnitude of this shift in focus, operational behavior, and practice methods also explains the difficulty in creating a sustainable business case for HIE.

The information contained in this report does not constitute an official position by the Maryland Health Care Commission, the Task Force to Study Electronic Health Records, or any of the parties involved in its development. This report was developed by the Delmarva Foundation and the Maryland Health Care Commission’s Center for Information Technology.

## II. Benefits from HIE

HIE offers enormous potential benefits to health care in the United States. In the ideal vision of HIE’s future, consumers who switch physicians or insurers, or who seek

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1 <http://www.jcaho.org/accredited+organizations/ambulatory+care/sentinel+events/rc+of+delay+in+treatment.htm>

2 [http://www.sba.muohio.edu/abas/2001/brussels/van%20der%20Reis\\_BrusselsPresentation.pdf](http://www.sba.muohio.edu/abas/2001/brussels/van%20der%20Reis_BrusselsPresentation.pdf)

3 iHealth & Technology – March 2005

4 <http://www.ehealthinitiative.org/pressrelease825A.aspx>

emergency care, will no longer suffer from delayed or lost medical records. The benefits of HIE would be far reaching: efficient and dependable HIE would reduce redundant laboratory tests for patients who seek care in different settings, reduce duplication of radiology studies through digital transmission of reports, enable reliable connections to pharmacies to help generate better medication lists, and reduce adverse effects from drug interactions. HIE could also be used to improve the referral process and communication between providers, and transitional care (such as between clinic and hospital) would be safer for all patients. Connections to and between agencies in the public health system could provide more timely information about disease and bioterrorism outbreaks, allowing for more rapid response and the potential to save many lives.<sup>5</sup>

The benefits of HIE are debatable, however, when weighed against the cost of its adoption and initial use. Implementation costs can be substantial, especially for smaller providers and health systems. These costs may simply outweigh the benefits that may accrue in the short term, despite the significant benefit to individual patients and to society as a whole. Establishing connections to shared data requires expensive, sophisticated technical interfaces. System variability plays a role here – few common standards or frameworks are in place to allow the sharing of data. The lack of standards has broad implications beyond cost. Gaining interoperability of systems requires time and effort in the development of standards or frameworks; standards cannot be created and imposed externally (for example, by states) without significantly affecting those providers and systems that have already implemented electronic health records and initiated health information exchange. Instead, frameworks that allow interoperability must be created through the collaboration of stakeholders. Concerns regarding privacy, security, confidentiality, and appropriate use are also significant issues that must be addressed if HIE is to succeed. Beyond the basic questions of technology and applications, sharing entities must also protect themselves through careful legal assessment and specific, carefully crafted agreements.<sup>6</sup>

### **III. Infrastructure Challenges**

Infrastructure issues, such as the accessibility of reliable, fast electronic connections, continue to hinder the wider adoption and use of HIE. As with the use of an electronic health record, the long-term benefits of HIE extend primarily to the payers and purchasers of care. Asking providers to make a substantial initial investment in the technology to support HIE, and to accept a new model of data ownership, are issues with significant implications. Another major hurdle confronting the establishment of a system of electronic HIE is obtaining start-up funding.

In pursuit of the potential benefits of HIE, a myriad of federal, state and private efforts have been launched. These efforts take many forms, but generally attempt to reduce barriers to interoperable information exchange through financial or regulatory means. Purchasing collaboratives such as the Leapfrog Group and Bridges to Excellence have launched campaigns to increase HIE adoption. Payers such as

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<sup>5</sup> Institute of Medicine. Patient safety: Achieving a new standard for care. Washington, DC: National Academy Press; 2003.

<sup>6</sup> Brailer DJ, Augustinos N, Evans L, Karp S. Moving toward electronic health information exchange. Santa Barbara: SBCCDE; 2003 July.

Massachusetts Blue Cross / Blue Shield have contributed \$50 million to enable sharing between providers, with the goal of recouping their expenditures through reduced future costs. In addition, multiple organizations concerned with the quality and safety of health care, such as the National Quality Forum, the federal Agency for Healthcare Quality and Research, and others have funded a variety of projects related to reducing these barriers.

A key federal action was the appointment of a National Coordinator for Health Information Technology, and the creation of a special office within the federal government to facilitate the adoption of electronic health records and health information exchange. Federal regulations such as those outlined in the Health Information Portability and Accountability Act of 1996 (HIPAA) have helped to launch standards development for the exchange of electronic information, most notably HIPAA's Standard Transaction and Code Sets Regulations.<sup>7</sup> The infrastructure, created to operationalize HIPAA's protections of privacy, confidentiality, and security of data, has proven useful in the formation of health information exchange agreements, and as a means of keeping the public informed of its rights in these matters.

"The Architecture for Privacy in a Networked Health Information Environment," a policy guide published by the Markle Foundation's *Connecting for Health*, outlines nine principles that should be built into any information-sharing system or network in order to ensure confidentiality and privacy of patient data.<sup>8</sup> These principles include:

- Openness and transparency
- Purpose specification and minimization
- Collection limitation
- Use limitation
- Individual participation and control
- Data integrity and quality
- Security safeguards and controls
- Accountability and oversight
- Remedies

Connecting for Health believes that technical and policy challenges stand in the way of widespread HIE; however, it concludes that no perfect technical or policy solution exists for problems related to HIE. Critical to the success of HIE is the development of a guiding policy that:

- Establishes uniform access management practices.
- Sets acceptable limits on the appropriate use of information.

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<sup>7</sup> Center for Information Technology Leadership. CPOE in ambulatory care. 2003 [cited 2005 Jan 30]; Available from: <http://www.citl.org/research/ACPOE.htm>

<sup>8</sup> Rhodes, Harry B.. "Privacy and Security Challenges in HIEs: Unique Factors Add New Complexities to Familiar Issues." *Journal of AHIMA* 77, no.7 (July/August 2006): 70-71,74.

- Agrees upon the extent of patient control over personal health information.
- Makes technology choices that support privacy and security policy objectives.

Connecting for Health also recently published “A Model Contract for Health Information Exchange,” which outlines the terms and conditions through which to insure the confidentiality, security, and permitted disclosure and use of protected health information. The model names the following essential elements for an HIE contract:

- Each HIE participant must comply with health care privacy, confidentiality, security, and use standards.
- Each HIE participant must comply with state and local privacy, security, and use laws.
- Each HIE participant shall report to the other serious breaches of confidentiality.
- Established limitations will be placed on the use and disclosure of protected health information.
- Protected health information will be secured by appropriate administrative, physical, and technical safeguards.
- Each HIE participant shall report to the other any use of protected health information outside the established terms and conditions.

#### **IV. The Role of the Federal Government on HIT/HIE Adoption**

The federal government has compelling reasons to address HIT/HIE adoption. Although the public is only now becoming aware of errors and mistreatments in care delivery, the incidence and severity of errors has been known by researchers for some time.<sup>9</sup> The health status of Americans is lower than it would be if care were seamless, timely, and based on the best available medical evidence – all of which the adoption and use of HIE could deliver. Health care inefficiency and quality problems create economic burdens on other industries. When working Americans spend large shares of their time moving between physicians, dealing with the morbidity of improperly treated chronic illness, handling care burdens for their elderly parents, and recovering from errors and unnecessary therapies, the productivity of the American labor force, and America’s position as a global economic leader, is harmed.

The federal government has numerous means of stimulating change in the health care industry, even if most of that change occurs in the private sector. While the federal government should not seek to reform health care through the use of information technology without active industry collaboration, neither should it let the status quo exist simply because change will be difficult, complicated, and challenging to the industry. Private industry can learn much from the early efforts of government providers in leading closed health care delivery systems. The Department of Defense (DoD) and the Veterans Administration (VA) are major federal health care delivery systems with extensive experience in HIE. The lessons these organizations have learned about

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<sup>9</sup> Framework for Strategic Action Tommy G. Thompson Secretary of Health and Human Services, July 21, 2004.

HIT/HIE are an invaluable national asset, and should be more readily diffused through relationships with private delivery networks.<sup>10</sup>

## **V. Preliminary Cost Estimates**

An estimate of the cost for any multi-stakeholder group to develop a significantly capable system of HIE is a huge undertaking, and at a minimum should include: planning, development and implementation, and operations. In the planning phase, costs generally range from roughly \$300,000 to \$1,000,000, and involve intensive educational sessions, meetings, business planning, readiness assessments, vendor selection, and legal and organizational costs.<sup>11</sup>

The costs of the development and implementation phase depend on the scope of the project, including the technical and business approaches, as well as decisions about how different project costs are shared among the parties. Costs for this phase can range from approximately \$3 million to \$10 million, depending on the technology platform selected, the vendor, and the number and complexity of the interfaces that need to be built, among other considerations.

Costs in the operational phase also vary, depending on whether the exchange takes on more ambitious tasks such as providing technical support to providers, or coordinating community-wide health improvement projects. Generally speaking, operational budgets vary between \$2 million and \$5 million annually. These estimates are based on the current, early stage of HIE development.

HIE requires a core set of services and functions for exchanging patient information: establishing patient identity, authenticating the identity of the requester, establishing proper authorization by the patient, and locating relevant data from connected systems. These services require a common framework resulting in a single set of network protocols, standards, and policies.

While there are many different models and variations of electronic health information exchange, three basic data architectures have emerged:<sup>12</sup>

- **Provider-Centered:** The closest model to current practice, where information exchange is controlled by the provider, and the patient control is via the provider.
- **Patient-Centered:** Strong patient control over exchange of clinical information. HIPAA's treatment, payment, and health care operations ("TPO") exchange is unaffected.
- **Intelligent Switch:** A private-public exchange where TPO flows via a switch. Multi-stakeholder agreement on principles and content is essential. Exchange is built on a trust hierarchy, where the patient controls the switch.

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<sup>10</sup> Framework for Strategic Action Tommy G. Thompson Secretary of Health and Human Services, July 21, 2004.

<sup>11</sup> Walker J, Pan E, Johnston D, Adler-Milstein J, Bates DW, Middleton B. The Value Of Health Care Information Exchange And Interoperability. Health Aff (Millwood) 2005.

<sup>12</sup> Information obtained from an April 2006 presentation by Dr. Rex Cowdry of the Maryland Health Care Commission.

## VI. Survey Information – HIE Exchange Initiatives

The eHealth Initiative Foundation's Second Annual Survey of State, Regional and Community-Based Health Information Exchange Initiatives, through its August 2005 publication, show progress in the current state of evolution of HIE across the country, and are excerpted below:

1. How many HIE efforts are there, and how many of them are advanced enough to be operational (exchanging health care information electronically between diverse parties)?
  - Forty-four (44) respondents identified themselves as being within the early stages of development (between Stages 1 and 3: see these stages explained, below).
  - Sixty-five (65) identified themselves as being in the advanced stage of development (between Stages 4 and 6).
  - The breakdown of those in the advanced stages included 40 HIE efforts in the implementation phase (Stage 4).
  - Twenty-five (25) HIE efforts report that they are completely operational (between Stages 5 and 6).
  - The number of operational HIE efforts is advancing quickly. The reported number of HIE efforts considered “fully operational” increased from nine in 2004 to 25 in 2005.

### *Stages of Development for health information exchange at the community level*

*Stage 1:* Recognition of the need for health information exchange among multi-stakeholders in your state, region or community (public declaration by a coalition or political leader).

*Stage 2:* Getting organized; defining shared vision, goals, and objectives; identifying funding sources, setting up legal and governance structure (multiple, inclusive meetings to address needs and frameworks).

*Stage 3:* Transferring vision, goals and objectives to tactics and business plan; defining your needs and requirements; securing funding (funding organizational efforts under sponsorship).

*Stage 4:* Implementing- technical, financial and legal (pilot project or implementation with multi-year budget identified and tagged for a specific need).

*Stage 5:* Fully operational health information organization; transmitting data that is being used by health care stakeholders (ongoing revenue stream and sustainable business model).

*Stage 6:* Demonstration of expansion of organization to encompass a broader coalition of stakeholders than present in the initial model.

## 2. How concerned are HIE organizations with patient privacy and security?

- Fifty-nine percent of advanced stage HIE organizations (those who are already exchanging electronic health information) go beyond HIPAA requirements in their policies for data exchange.
- Planning for safe, secure data exchange is a priority for HIE efforts. Eighty-three percent of advanced stage respondents have contractual agreements among health information exchange participants, 92 percent of which cover authorization of users, 89 percent of which cover privacy and security procedures, and 87 percent of which cover terms for information use.

## 3. What kind of information are advanced HIE efforts exchanging?

- A majority of these HIE efforts are exchanging (or expecting to exchange within six months) data related to outpatient and inpatient episodes, laboratory results, emergency department episodes, pathology results, and enrollment and eligibility information.
- More than half of these HIE initiatives are currently providing disease or chronic care management services or plan to do so within the next six months.
- Just less than half (45 percent) are currently supporting quality performance reporting efforts or plan to provide such services within the next six months.
- More than three out of four (76 percent) are employing the use of standards to exchange data electronically.

## 4. How are HIE efforts organized?

- A majority (55 percent) are led by a neutral, multi-stakeholder entity.
- More than half (60 percent) are incorporated, and 70 percent of these efforts are following non-profit models.
- Providers continue to be involved in a majority of HIE efforts; hospitals are involved in 61 percent. Primary care physicians are involved in just less than half of HIE efforts. Community health clinics play a key role in 35 percent of HIE efforts.
- Other players in the governance of HIE efforts include health plans (37 percent), local health departments (33 percent), employers and purchasers (27 percent), patient or consumer groups (26 percent), state public health agencies (21 percent), quality improvement organizations (16 percent), and healthcare IT suppliers (12 percent).

## 5. What is the greatest challenge facing HIE efforts?

- Funding is the greatest challenge for all HIE efforts. Ninety-one percent of all respondents cited "securing upfront funding" as either a very difficult or moderately difficult challenge. HIE initiatives must consider funding sources for both upfront funding and ongoing funding for operations



- Just under half (46 percent) of all HIE efforts report federal government grants and contracts as a current revenue source for upfront funding, while 48 percent of advanced stage initiatives cited this as a revenue source for ongoing operations.
- Alternative funding sources for sustainability include advance payments from data sources. Thirty-eight percent of these HIE efforts receive advance payments from hospitals, and 33 percent receive advance payments from physician practices. A smaller number of advanced HIE efforts receive advance payments from other stakeholders, including public health (19 percent), laboratories (15 percent), payers (15 percent), and purchasers (9 percent) to support ongoing operations.

6. Other than funding, what are other common challenges HIE efforts face?

- Eighty percent of HIE efforts said accurately linking patient data is a very or moderately difficult challenge.
- Seventy-four percent of HIE efforts list engaging health plans as a very or moderately difficult challenge

## VII. Lessons Learned from the Past – CHINs

During the 1980's and 1990's, in response to the managed care movement, many hospitals began to merge into what became known as integrated delivery networks. The initial integrated delivery networks appeared where the pressure of managed care was the greatest, mainly in California, Minnesota, Missouri, Utah, and others. Along with these new systems came the need for data. In response to that need, CHINs -- Community Health Information Networks -- were formed. Over time, however, they did not work, and nearly all failed.<sup>13</sup> CHINs were an intellectually supported "concept," but were not fully conceptualized at the implementation level, for reasons discussed below.

*Buy-In and Conflicting Missions:* Most CHINs did not create a common and shared mission in order to further develop and survive. There were conflicting missions because of competitive forces among the health providers within a CHIN. Many health care organizations within a community were competing for patient business, thus making their proprietary interests a priority. The conflicting missions led to poorly conceived objectives for the collaborations and wasted effort.

*Trust/Control:* Who should control the CHIN was an issue. There were questions about how to give access to those that did not contribute financially, and about what information they were allowed to use. A related issue was the perceived loss of control by some participants. This was especially true for those participants who believed that "one" organization was in control. Electronic vendors also pushed the CHIN approach, leading some to suspect that their motives were to use their technology or applications

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<sup>13</sup> Strategies for Creating Successful Local Health Information Infrastructure Initiatives, Nancy M. Lorenzi, PhD. December 16, 2003.

as the infrastructure for the CHIN. Vendors and other hospitals that were not involved in the integrated delivery network did not want to collaborate with an approach tied to one of their competitors. This was a major reason for the failure of the CHIN model.<sup>14</sup>

*Ownership:* Related to a health institution's proprietary interest was the lack of clear ownership over data systems and information. Health institutions highly value information, because it is information that drives their business. CHINs planned for and intended the integration of information both enterprise-wide or across institutions, therefore presenting another form of control issue.

*Financing:* There were three components to the issue of financing a CHIN—who should pay for what, how to develop a sustaining funding model, and whether all the participants in the CHIN believed that they were obtaining value for their contributions. Some people within the CHINs felt that they were in a negative-value situation from the onset; that is, the amount of resources needed to develop the system was disproportionate to the perceived value they obtained from participating in the CHIN.<sup>15</sup> This occurred when the developers of a CHIN determined the value-added benefit to a community before the community identified it as a benefit itself. The CHIN developers believed that the community would see the benefits once the developed CHIN was demonstrated.

*Data Sharing/Technology of the Day:* There were problems with data sharing. Most CHINs wanted a model that “wired” all data from hospitals, doctors, insurers, purchasers and others into a large community-based data repository where claims, enrollment, remittance, encounter, clinical outcomes and other elements would be managed for common community use. The technology and politics of sharing data in “one pot” doomed many efforts. The technology of the day also became a barrier: the Internet was not yet available, and the technology that could potentially deliver what was wanted was both expensive and “clunky”. The central database concept exacerbated the control and trust issues. However, several CHINs were successful in creating a “distributed database” that relied on connectivity among trading partners and using common standards.

## **VI. Local HIT/HIE Projects – A General Assessment**

While a number of health systems are moving forward in planning and implementing technology for shared information access and exchange, only Frederick Memorial Hospital and Peninsula Regional Hospital currently possess the technology to support limited shared access to clinical information. HIT/HIE initiatives underway in the state are reflective of similar developments on the national level. These initiatives are helping to drive investments in HIT and causing some administrators to think more broadly about what will be required in order to connect to the Nationwide Health Information Network, which is currently under development.

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<sup>14</sup> <http://www.nihp.org/Reports/Emerging-Opportunities-%20to-Lower-Transaction-costs.htm>

<sup>15</sup> Dowling, AF. CHINs—the Current State. In: Brennan PF, Schneider SJ, and Tornquist E, eds. *Information Networks for Community Health*. New York: Springer, 1997.

## Johns Hopkins Medicine

Johns Hopkins Medicine (JHM) has its own "regional" health information exchange network for patient care across its health system. Its electronic medical record system was developed internally, and is used system-wide to access more than five million patient records. Users of the system are able to access patient information that includes results from most ancillary services such as labs and radiology, among others. Clinical information can be accessed across disparate systems. Technology currently in place in the Johns Hopkins system includes Allscripts for e-prescribing, Eclipsys for physician order entry, GE Ancillary Systems (pharmacy, obstetric system, operating room management system), and Siemens Radiology.<sup>16</sup>

JHM has identified three strategic priorities as it moves forward with health information exchange:

1. Patient Identification across JHM via the comprehensive deployment of QuadraMed and similar solutions.
2. Consistent use of electronic medical records across Johns Hopkins Medicine.
3. Enhanced interfaces between departmental and entity-specific systems, to support evidence-based medicine and clinical decision support (Meditech, Eclipsys, Logician, ancillary systems, etc.).

*See Appendix A for more information about JHM's health information exchange networks.*

## Washington County Health System

Washington County Health System (WCHS) currently uses about eight different electronic health record products throughout its health system, which includes Washington County Hospital and Antietam Health Services. Their major inpatient vendor system is Meditech, which has been in place for about 14 years. Meditech accounts for around 95 percent of all transactions. However, since most medical practices in the area use Misys, WCHS is developing technology that will enable these systems to interoperate in a virtual mode. The technology, which is in a testing stage, is intended to function as a locator of patient information. Once the information is located, it is merged together and displayed on the desktop of the requestor.<sup>17</sup>

## Frederick Memorial Healthcare System

Frederick Memorial Healthcare System (FMH) founded the Frederick Medical Services Organization (FredMed) nearly eight years ago, to bring providers and the hospital together for the exchange of patient information. The initiative is largely funded by FMH, and is governed by a Board of Directors that consists of three elected physician members and two hospital representatives. FredMed offers physicians a cost-effective

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<sup>16</sup> Information source: Johns Hopkins Medicine - Stephanie Reel, CIO and Vice President, Information Systems

<sup>17</sup> Information source: Washington County Health System - Carey Leverett, Vice President, Information Services

way to connect to FMH for purposes of information exchange. Approximately 165 physicians use the system to gain access to FMH. The technology is available to physicians on a wide area network that provides high speed connection to FMH, allowing access to Meditech and other FMH applications. FredMed participants also have access to a practice management system from Misys, from whom FredMed has recently agreed to purchase an electronic medical record system.<sup>18</sup>

FMH also has a physician portal that allows physicians to access lab results from any location, and includes a Picture Archiving and Communication System (PACS) for viewing x-rays.

*See Appendix B for more information about FredMed.*

### University of Maryland Medical System

The University of Maryland Medical System (UMMS) is comprised of the following hospitals: University of Maryland Medical Center (UMMC), University Specialty Hospital (USH), Maryland General Hospital (MGH), Baltimore Washington Medical Center (BWMC, formerly North Arundel Hospital), Kernan Hospital, Mt. Washington Pediatric Hospital, and Shore Health System (SHS, part of UMMS as of July 2006). Each hospital's health information technology system operates independently. UMMS is in the early stages of developing a strategy for a system-wide electronic medical record that can be shared across all of its hospitals.<sup>19</sup>

UMMS is in the process of implementing EPIC as the ambulatory services technology system for all hospitals. UMMS plans to maintain separation in hospital technology systems, and will develop an interface using an enterprise master person index (EMPI) for locating patients.

*See Appendix C for more information about UMMS health information exchange networks.*

### Maryland/D.C. Collaborative for Health information Technology

The Maryland/D.C. Collaborative for Healthcare Information Technology (the Collaborative) has a unique mission – “to work collaboratively with Maryland and Washington, D.C. health care providers and organizations to improve quality of care, patient safety, and efficiency through health care information technology.”

The Collaborative was established in May of 2004; however, regional stakeholders had been meeting for two years prior to its incorporation as a non-profit entity. The Collaborative's goal is to establish a RHIO, or regional health Information organization infrastructure, linking all components in the Maryland/D.C. health care delivery chain – physician offices, hospitals, clinics, labs, imaging centers, nursing

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<sup>18</sup> Information source: Frederick Memorial - Jackie Rice, EMR Team Supervisor, and Tina Whims, IT Director for Frederick Health Services

<sup>19</sup> Information source: UMMS - Jon Burns, CIO and Senior Vice President

homes, payers and patients – for secure and appropriate exchanges of health information. The interoperable environment is intended to enable or enhance communication of patient information, quality of care, patient safety, disease management capabilities, patient and provider satisfaction, clinical and administrative cost reductions, and bio-surveillance/early detection preparedness.

The original goals and objectives of the project were to determine if data exchange:

1. Is economically sustainable in our region,
2. Will improve the quality and the safety of patient care by standardizing medical practice and reducing duplicative testing, and
3. Will decrease clinical and administrative costs.

The Collaborative has worked diligently over the last two years to achieve these objectives, beginning with educating Maryland state officials, regional health care leaders, and private foundations on the importance of this project. Unfortunately, significant funding for the pilot project has not materialized, and therefore these specific project goals and objectives remain untested in our region.

However, significant accomplishments in the areas of governance structure, coalition building, and information technology planning did occur. These accomplishments include:

1. Forming a non-profit entity with an agreed-upon governance structure and a working Board of Directors representative of all the major stakeholders in the region.
2. Gaining the support of over 35 major health care organizations in the region, including community physicians, community hospitals, Johns Hopkins Medicine, University of Maryland Medicine, MedStar, CareFirst Blue Cross Blue Shield, and Aetna.
3. Establishing six volunteer working groups comprised of provider and technology leaders in the region.
4. Creating a Technical and Functional Specification Document to guide the development of the region-wide technical utility architecture.
5. Hosting many vendor meetings to begin the RFP process.
6. Researching and analyzing the quality and safety benefits of data exchange, as well as the projected financial ROI for stakeholders in our region.
7. Laying the ground work for a 2-phase, 5-year pilot project including: confirmed participants, agreed-upon data elements, agreed-upon data flow, metrics, and study methods.

8. Dedicating significant time and resources towards fundraising activities, including federal grants and contracts, Maryland state funding opportunities, and private foundations. Specifically, these activities required considerable educational and informational meetings, presentations, proposals, return-on-investment (ROI) studies, organizational planning and budgeting, and navigation of the political complexities in the region.

The Collaborative continues to build upon these important accomplishments, and is looking forward to initiating a pilot project in late 2006. A feasibility study by Navigant Consulting is now in progress to further define the initial scope and funding mechanism for this project.<sup>20</sup>

### Peninsula Regional Medical Center

Over the last 10 years, Peninsula Regional Medical Center has invested nearly \$130 million on state-of-the-art clinical, surgical, medication dispensing, pharmaceutical and information technologies. About a decade ago, the hospital recognized the value of building information technology to support the growing infrastructure of the hospital. Peninsula Regional Medical Center uses McKesson's Physician Portal to allow physicians to obtain patient information from hospital records. Physicians have access to the medical record, and radiology and cardiac images. More than 100 physicians currently have access to the system.<sup>21</sup>

### Metro DC Health Information eXchange (MeDHIX)

MeDHIX is a Health Information Exchange which will link the electronic health record systems of the Metro DC region's safety-net clinics with each other, with the region's hospitals, and with other mainstream healthcare providers, to improve patient safety, care quality, and efficiency for the region's uninsured populations. Non-profit associations (initially Primary Care Coalition of Montgomery County and District of Columbia Primary Care Association), safety net clinics, hospitals and local governments have formed a regional community of interest for MeDHIX that is focused on the specific needs of the uninsured and the safety-net environment.<sup>22</sup>

The MeDHIX Health Information Exchange will facilitate point of care access to a patient's complete medication information, allergies, problem/diagnosis lists, assessments, and lab results from the disparate systems of safety-net clinics, hospital emergency departments (EDs), specialty providers, and other mainstream healthcare providers. Initial participants in MeDHIX will be safety-net clinics and Hospital EDs where exchange of health information can be expected to achieve the following kinds of benefits:

- Increase ability to more rapidly assess, triage, and effectively treat safety-net patients

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<sup>20</sup> Information source: Maryland/D.C. Collaborative For Health Information Technology – Dr. Victor Plavner, Chairman

<sup>21</sup> Information source: Peninsula Regional Medical Center – Brad Taylor, Technical Services Manager

<sup>22</sup> Information source: Primary Care Coalition of Montgomery County, MD, Inc. – Erin Grace, Senior Vice President

- Decrease likelihood of inappropriate or duplicative medication administration.
- Decrease inappropriate ED visits.
- Increase the use of safety-net clinics for primary care through appropriate referral.
- Avoid duplicative workups caused by lack of access to recent patient data—
  - ED does not have safety-net data.
  - Safety-net clinic does not know that an ED visit occurred.
  - ED does not know patient seen recently at another ED.

The initial planning for MeDHIX was funded by a “Transforming Healthcare Quality through Information Technology” planning grant from the Agency for Healthcare Research and Quality (AHRQ) that was awarded to the Primary Care Coalition. A subsequent three-year implementation grant from AHRQ, along with matching funds from community partners, has been awarded to fund the implementation of MeDHIX. It will be structured as a health information exchange “community of interest” for safety-net providers within the National Capital Area.

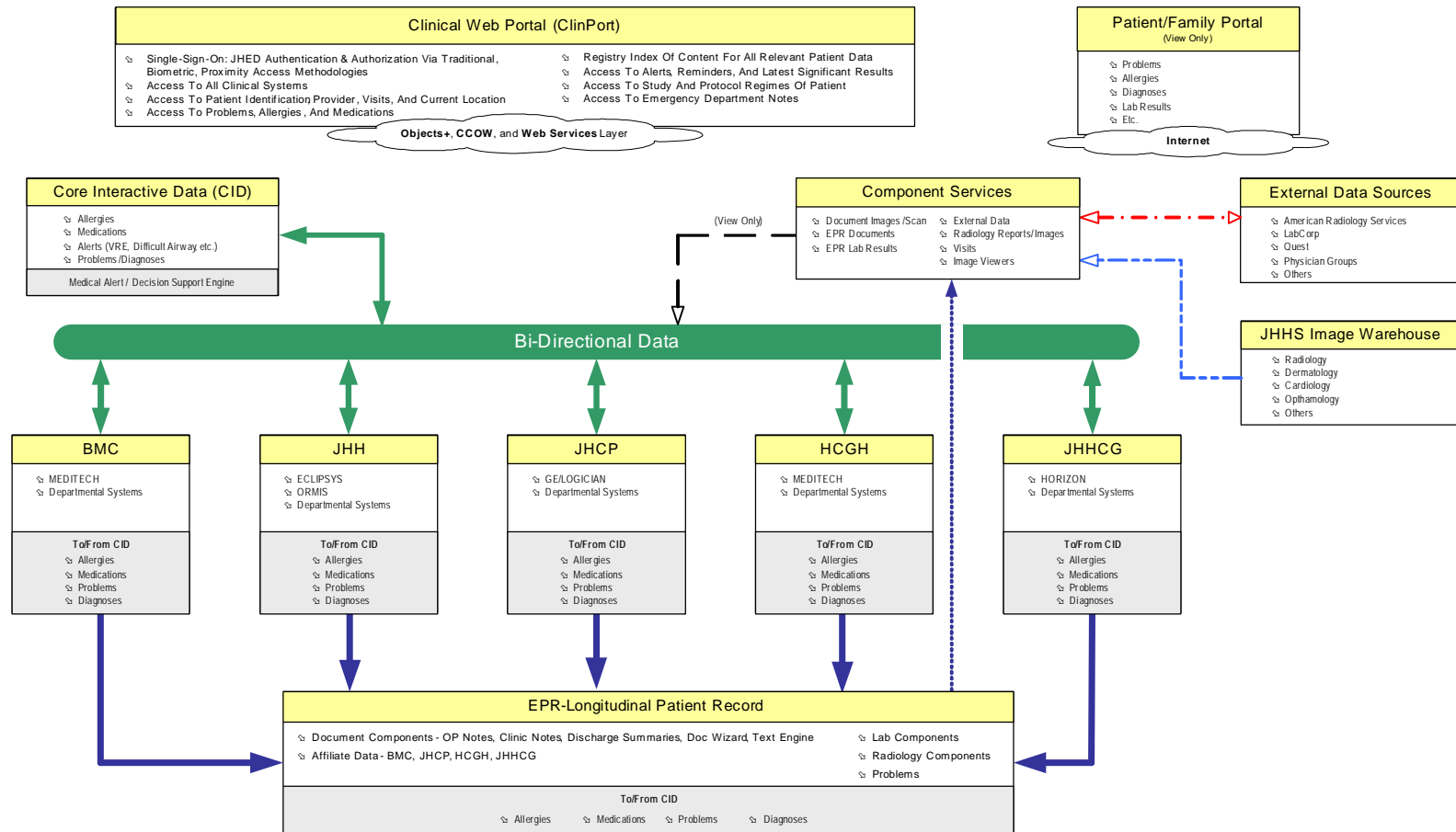
## **VII. Suggestions for Possible Work Group Discussion**

The Task Force to Study Electronic Health Records is well positioned to make broad policy recommendations relating to HIT/HIE. Recommendations put forth by the Infrastructure Management & Policy Development Work Group to the Task Force will help shape the final report. The following questions are for discussion by the Work Group as it moves forward with its investigation of HIT/HIE:

- How do we avoid creating a measure centric system in the new patient centered paradigm that narrowly focuses on outcomes?
- What changes should be made in the existing reimbursement system with the implementation of HIE? Should HIT/HIE be considered the driver for changing the existing reimbursement structure?
- What role can HIT/HIE play in pay for performance/pay for outcomes initiatives?
- What role should the state adopt in advancing HIE? Convener/facilitator/funding mechanism?
- If the Intelligent Switch data architecture were adopted today as the standard model of exchange, what are the controls and processes by which a patient should have control over their medical information?
- How do you build consumer trust in HIE?
- What steps can be taken to ensure that HIT/HIE implementation does not lead to the de-professionalization of medicine?

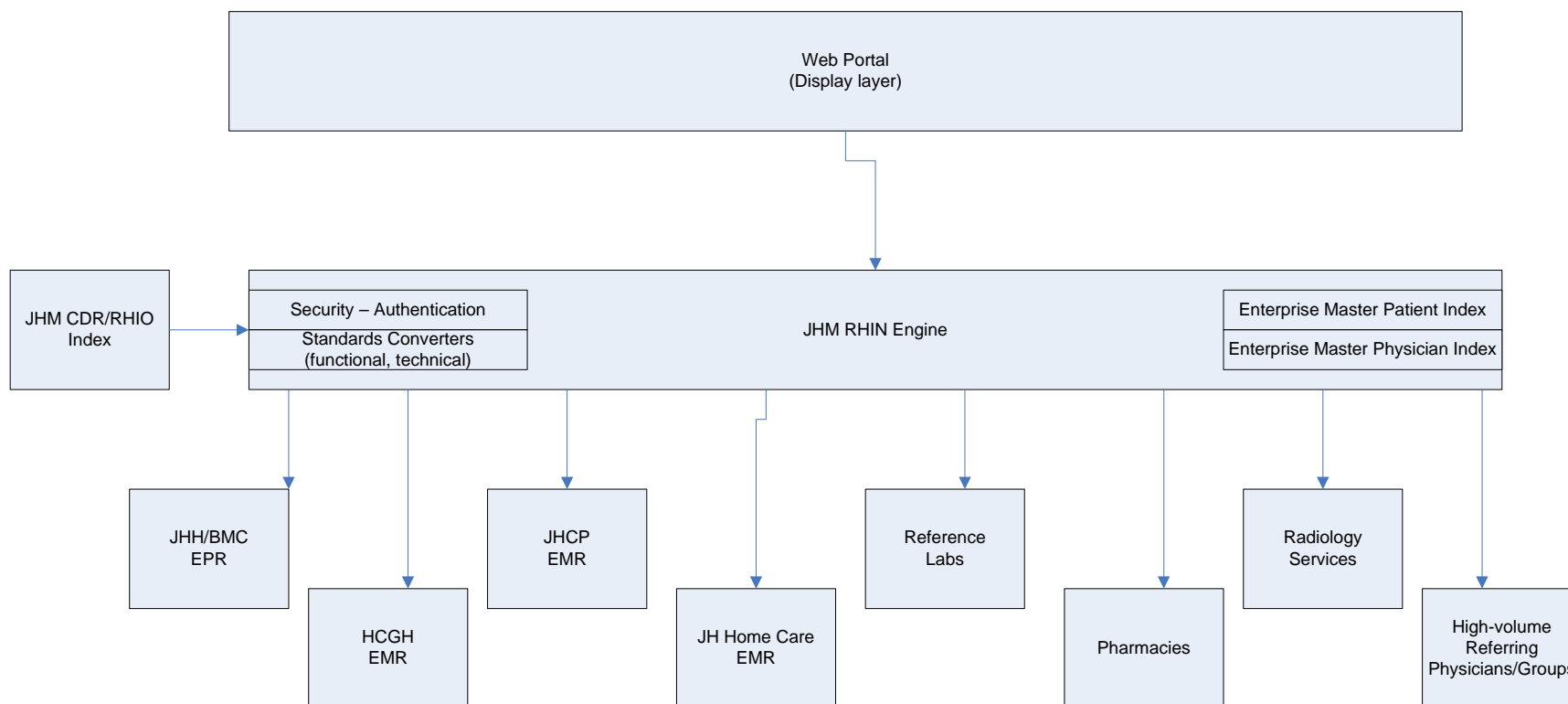
## APPENDIX A: Johns Hopkins Medicine (JHM)

### JHM Clinical Systems Strategy Portal

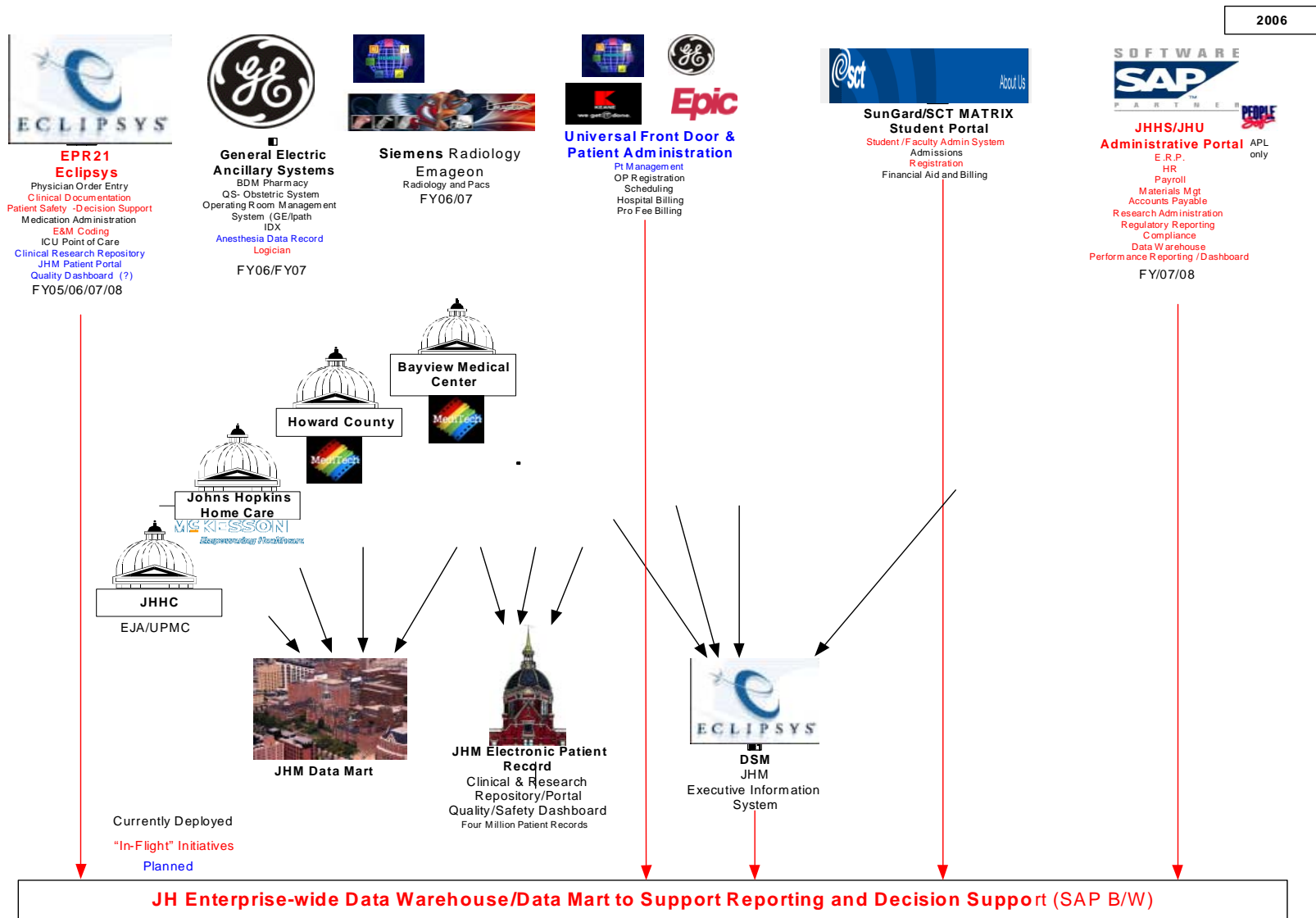




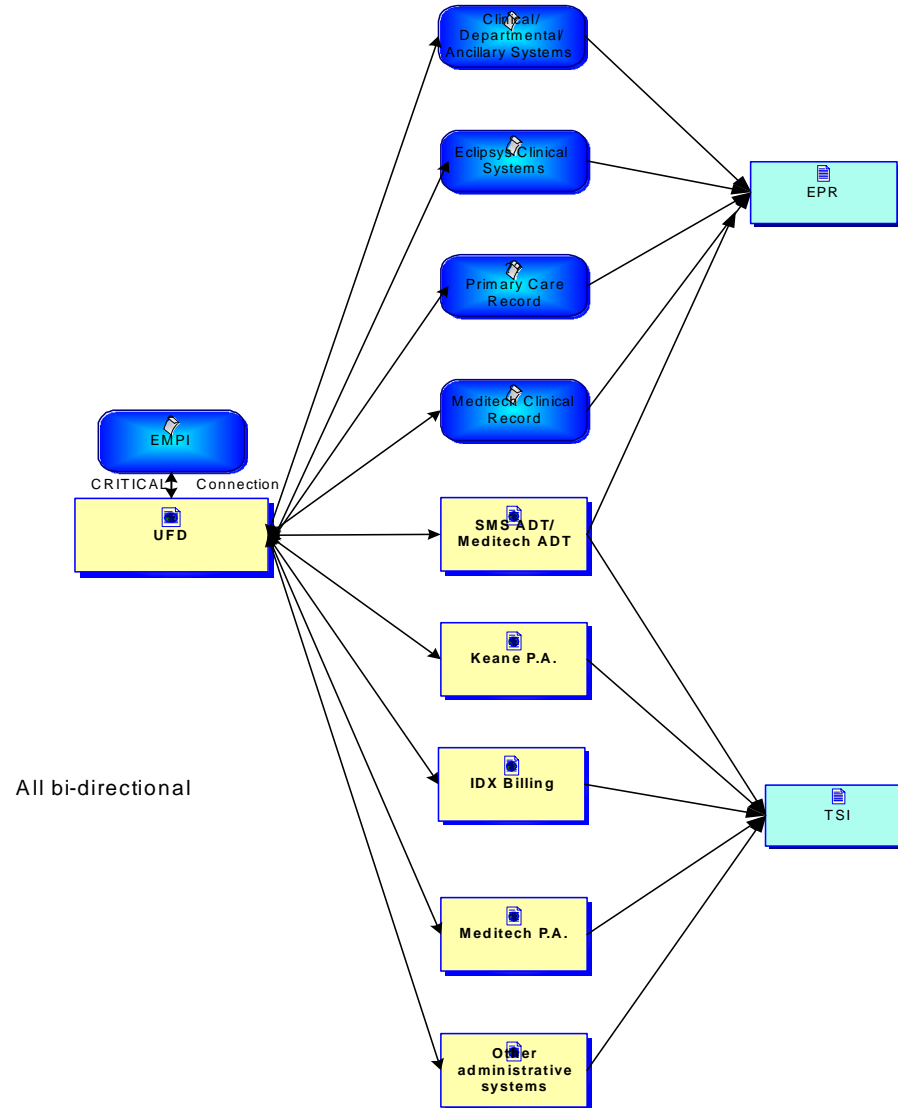
# JHM Regional Health Information Network (RHIN) 2/21/06



# JHM System Map

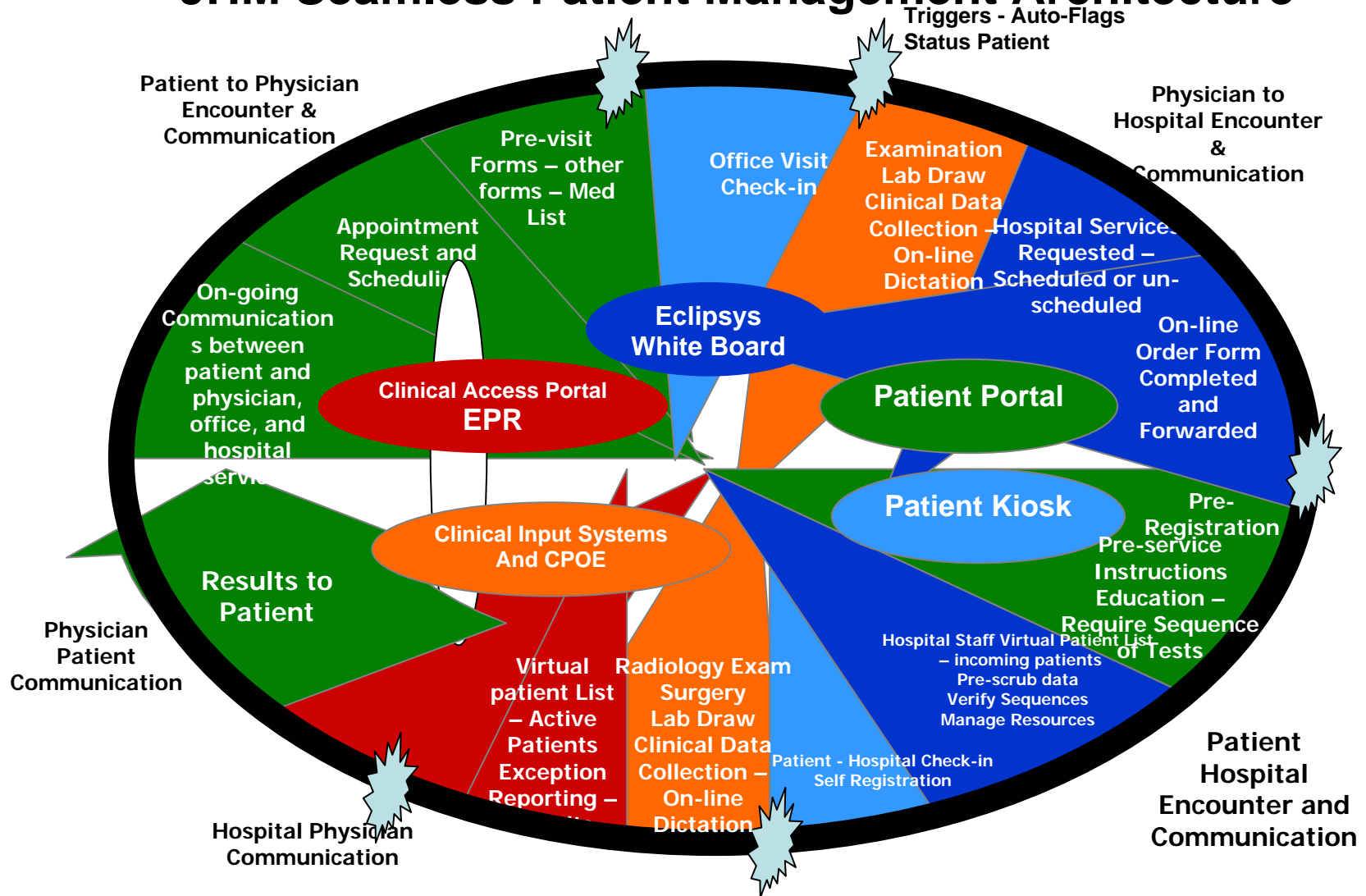


## JHM UFD



The UFD solution can be any system that can capture visit and patient level data flexibly ; the decision should not be driven by integration with any one system , but rather by the ability of a solution to collect , accept, aggregate , update , communicate , report and reflect data so that it can be ingested by all systems .

# JHM Seamless Patient Management Architecture



## **APPENDIX B: Frederick Memorial Healthcare System**

### **Frederick Medical Services Organization (FredMed)** **Directory of Services<sup>1</sup>**



#### **Computer Support Services**

FredMed can enhance your office's computing power by providing assistance with most computer related tasks, including purchases, upgrade recommendations, PC troubleshooting, software installations and securing wireless networks.

[Click here for more...](#)

#### **Wide Area Network (WAN)**

High Speed connection to FMH.

**FMH Basic Service Level** provides connection to Meditech and other FMH applications from FMH supplied equipment.

**FredMed Service Level** provides various bandwidth options with an "always on" connection to the Internet and provides instant access to Meditech and other FMH applications from all of your PCs.

#### **FMH Transcription Service**

Dictate office notes over the phone to FMH transcriptionists. Includes on-line access to your dictation through Meditech and automated distribution of copies and letters to FMH staff MDs.

#### **Web Site Design & Hosting**

FredMed can develop, host and maintain a public Internet site for your practice. We can offer you simple web site templates or work with a graphic design firm to develop a site customized to your office's needs.

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<sup>1</sup> Source: [www.fredmed.org](http://www.fredmed.org)

## **Electronic Prescription Management**

Electronic prescribing enables a physician to transmit a prescription electronically to a patient's pharmacy of choice. It decreases prescription errors caused by...

## **FredMed Vendor Alliances**

FredMed members are eligible to purchase various products and services from our vendor partners, frequently at negotiated discount rates. Our current lineup includes: Click on the following links for more...

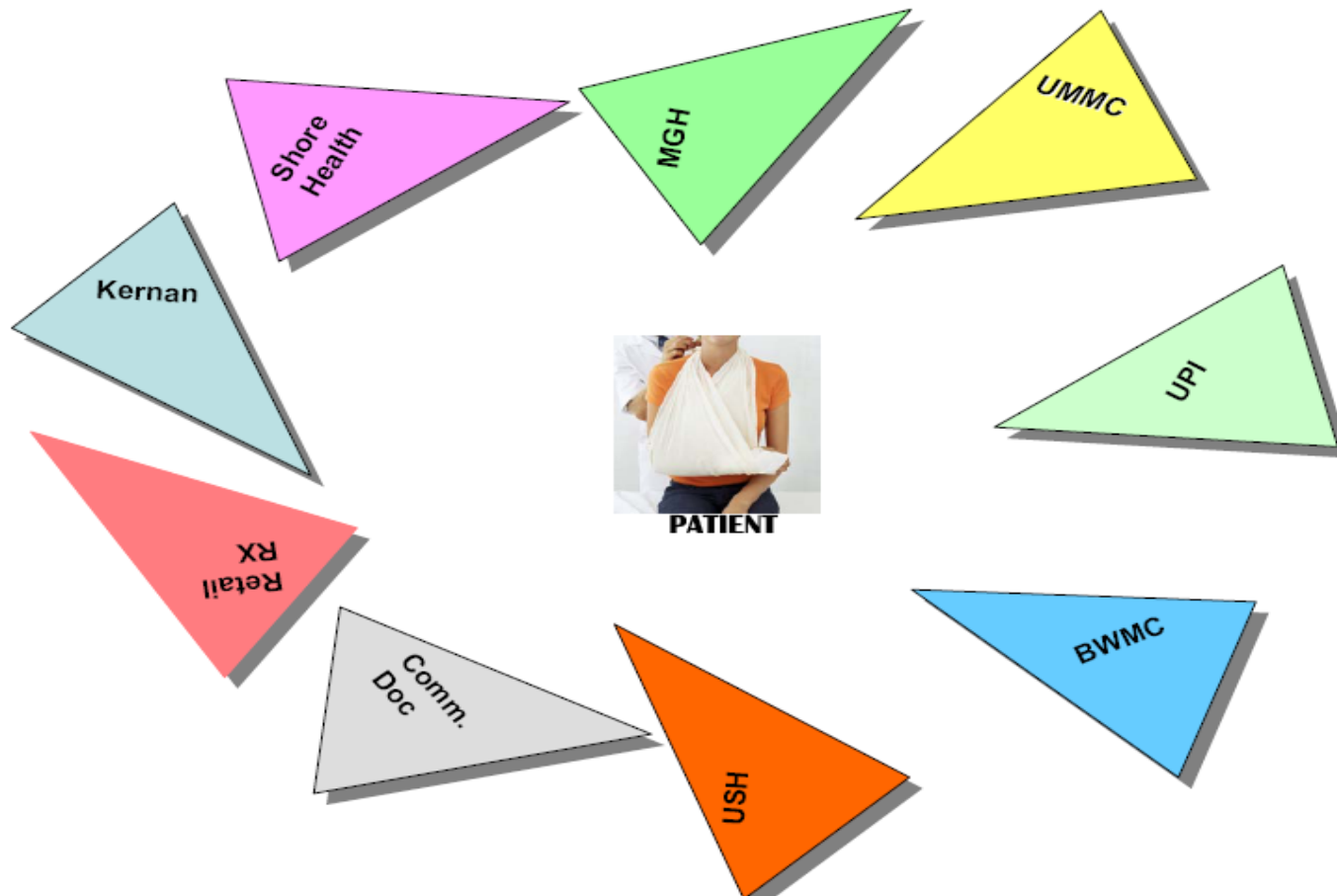
## **Practice Management System Services**

FredMed offers Misys PM (+Medic) and Misys Tiger practice management software. We also provide migration/ implementation assessments, consulting services, and system implementation assistance.

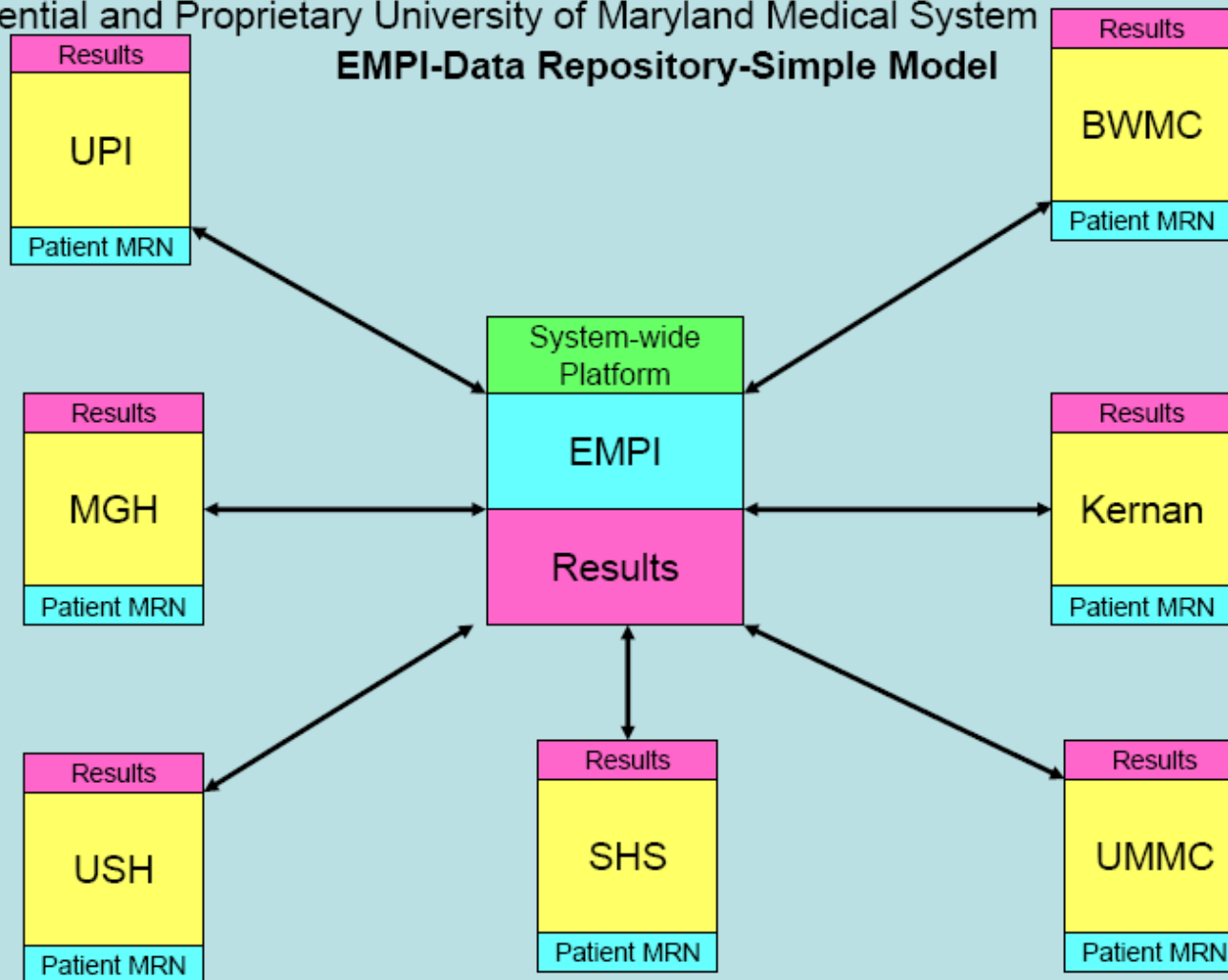
- [Answering Services](#)
- [Document Shredding](#)
- [Purchasing Alliances](#)
- [Billing Services](#)
- [Lab Interfaces](#)

**APPENDIX C: University of Maryland Medical System (UMMS)**

Confidential and Proprietary University of Maryland Medical System CURRENT STATE

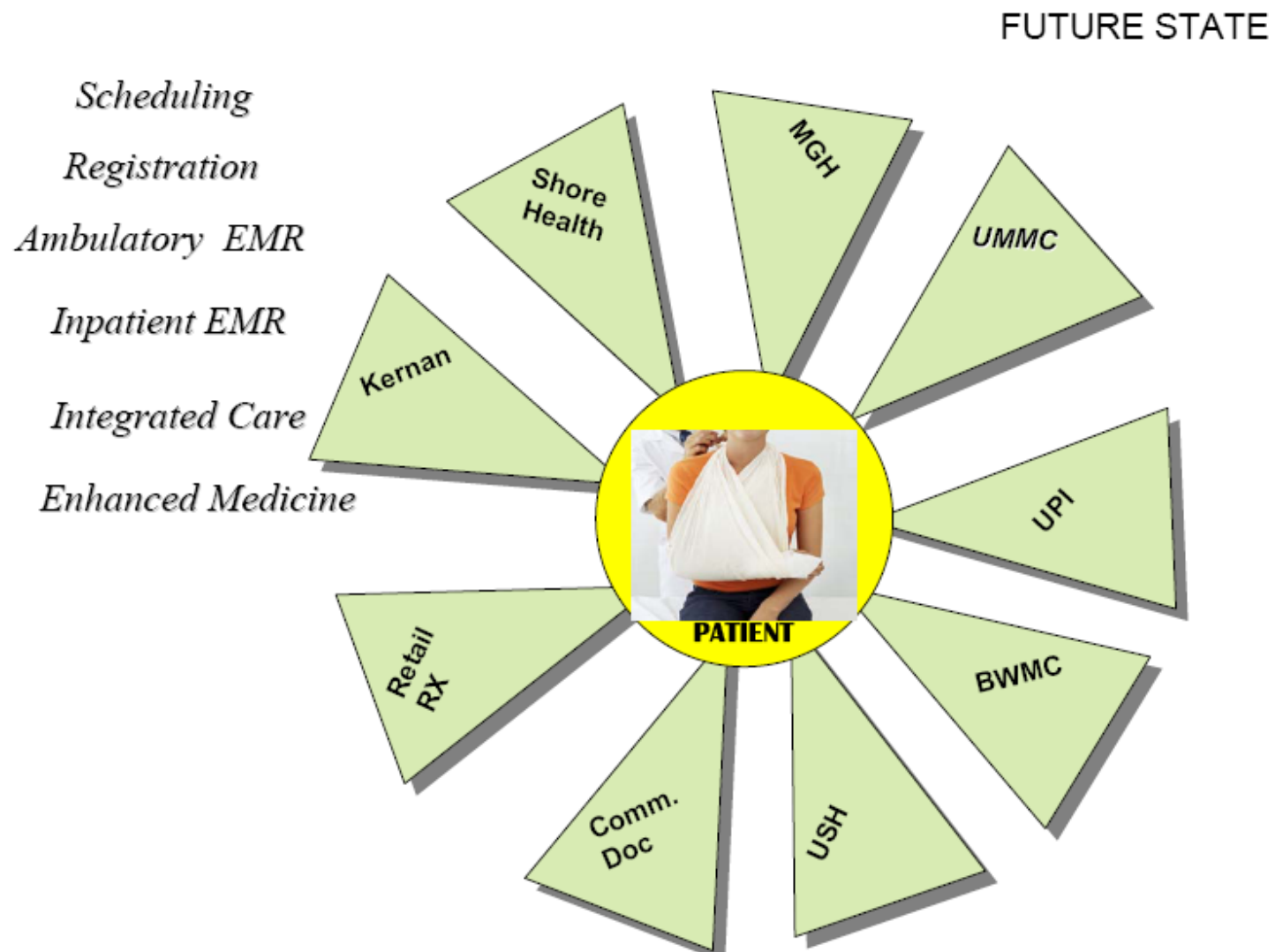


## EMPI-Data Repository-Simple Model



STEPPING STONE





Confidential and Proprietary University of Maryland Medical System